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MEMORANDUM OF THE THIRD MEETING OF THE US-USSR
JOINT COMMITTEE ON COOPERATION IN THE FIELD OF
ENVIRONMENTAL PROTECTION, MOSCOW, USSR
DECEMBER 9-12, 1974
STATINTL

The third meeting of the US-USSR Joint Committee on Cooperation in the Field of Environmental Protection was held in Moscow, USSR, December 9-12, 1974. The Joint Committee was established by the Agreement on Cooperation in the Field of Environmental Protection, signed in Moscow on May 23, 1972.

Having reviewed the progress made under the Memorandum of Implementation signed at the second meeting of the Joint Committee in Washington on November 16, 1973, the Joint Committee approved the results of the work carried out during 1974, adopted the present Memorandum setting forth the agreed programs of cooperation in the eleven areas of the Agreement for 1975, and designated the organizations responsible for implementation.

Both sides agreed that the program of cooperation adopted in preceding years serves as a sound basis for further cooperation. In this connection, both sides agreed that during 1975 the development of cooperation would be mainly directed towards the broadening and deepening of cooperation in existing projects.

Both sides agreed that all major decisions on changes in cooperative programs, including those concerning the organization of new projects and working groups, which are developed during 1975 should be subject to approval at the next meeting of the Joint Committee or by its Co-Chairmen.

The following program and plans for cooperation in 1975 were agreed upon and adopted during the third meeting of the Joint Committee:

AREA I -- PREVENTION OF AIR POLLUTION

Cooperation in this area will be carried out by six projects, five of which are coordinated by two joint working groups.

Project I-1.1 Air Pollution Modeling and Standard Setting

The project work program includes:

- Modeling development and quantitative evaluation of pollutant dispersion which is necessary for calculation of allowable emissions, with studies to include emission parameters, meteorological conditions, topography and averaging times, and supporting studies including energy budgets and reaction kinetics.
- Special studies in short-term forecasting, photochemical processes, transformation processes, and aerosol physics and chemistry.

The meeting of specialists originally scheduled for the fourth quarter of 1974 in the USA on atmospheric pollution modeling, aerosol and photochemical processes, including the joint analysis of the results of observations and their comparison with theoretical models, will take place in the USA during the first quarter of 1975. During the second half of 1975, a second meeting of specialists in the above areas of modeling will take place in the USSR.

Project I-1.2 Instrumentation and Measurement Methodology

The project work program includes:

- Development of technical recommendations for measurement networks, including measurement methodology, methodology of chemical analysis, calibration and quality control, and validation and reduction of data for gases and fine particulates.

- Setting up of identical stations in St. Louis and Leningrad for joint comparison of instrumentation, data, data analysis, and measurement methodology.

At the meeting of the working group, in addition to work on Instrumentation and Measurement Methodology, laboratory and field comparisons of instruments in use in both countries will be carried out. The comparison will also be concerned with the methodology of the measurement analysis, recording and processing of data.

At the project and working group meetings, an exchange of opinion and information will take place concerning the provision of air pollution modeling and methodology requirements insofar as needed for determining the effects of pollutants on human health and ecosystems.

The work of Projects I-1.1 and I-1.2 will be coordinated by Working Group I-1 -- Air Pollution Modeling, Instrumentation, and Measurement Methodology. The next (third) meeting of the working group will take place in the USA during the second quarter of 1975.

Project I-2.1 Gaseous Emission Abatement

Under this project first priority will be given to problems of gaseous emission abatement for sulfur dioxide. Three methods of stack gas desulfurization for thermoelectric power stations will be developed: limestone scrubbing, magnesium scrubbing, and ammonia scrubbing.

A US team will visit the USSR in the second quarter of 1975 to discuss the programs for cooperation in the field of investigating and developing stack gas desulfurization methods, including joint work on the design of two full scale electric power plant flue gas desulfurization facilities to be built in the USSR.

A Soviet team will visit the USA during the fourth quarter of 1975 to discuss the results of the current program and to develop further arrangements for the design of stack gas desulfurization systems.

During the first quarter the Soviet side will prepare for the US side a draft program of work, taking into account the US side's desire to visit the limestone scrubbing facilities at Magnitogorsk.

Project I-2.2 Particulate Abatement Technology

This project calls for the development of techniques for determining particulate collection equipment efficiency, methods of determining the physical and chemical properties of dusts, and design of electrostatic precipitators.

Under this project a Soviet team will visit the USA in the third quarter of 1975 to take part in the joint testing of fine particulate (under 3 microns) collection facilities, and in the fourth quarter of 1975 to study the test results and to prepare a final report.

A US team will visit the USSR in the third quarter of 1975 to assist in testing a Soviet electrostatic precipitator and wet scrubber. A Soviet team will visit the USA in the second quarter of 1975 to participate in updating and completing the electrostatic precipitator performance mathematical model, which will then be available for use in both countries.

To explore a program of cooperation to abate air pollution from the cement industry, a US team will visit the USSR in the second quarter. A Soviet team will make a reciprocal visit to the USA in the third or fourth quarter of 1975.

Project I-2.3 Process Improvement and Modification

This air pollution abatement project is concerned with the demetalization pretreatment for hydrodesulfurization of crude oil, economic aspects of desulfurization, gasification of coal, power generation using combined cycles with gasification pretreatment, coal cleaning, and refinement of processes in ferrous metallurgy.

To accomplish the objectives of the scheduled work, a US team of experts in the field of ferrous metallurgy will visit the USSR in the second quarter of 1975 to study dry quenching of coke developed in the USSR in order to evaluate its possible application in the USA. A Soviet team of experts in the same field will visit the USA in the third quarter of 1975 to become acquainted with the US air pollution control system in coke making and to develop a program of cooperation.

A US team of experts will visit the USSR in the third quarter to become acquainted with air pollution control in ferrous metallurgy. A Soviet team of experts will visit the USA in the fourth quarter of 1975 to become acquainted with air pollution control systems in steel making and blast processes and to develop a program for cooperation.

A Soviet team of experts in the field of demetalization pretreatment of heavy residual oils will visit the USA in the second quarter of 1975 with the aim of holding preliminary discussions of the results of catalyst investigations carried out in both countries and of introducing corrections into the research and operating programs.

Catalysts may be exchanged for the purpose of evaluation using standard test methods. A US team of experts in the same field will visit the USSR in the third quarter of 1975 to evaluate the results of catalyst tests and to prepare a final report and papers for publication.

A US team of experts in the field of coal cleaning and enrichment will visit the USSR in the third quarter of 1975 to evaluate material on flotation desulfurization of coal and to determine the direction of further joint work. A Soviet team of experts in the same field will visit the USA in the fourth quarter of 1975 to develop programs for joint work, final coordination of working plans, and familiarization with the experience gained in the USA.

A Soviet team of experts in the field of fuel gasification and economics of hydrodesulfurization of liquid and solid fuels will visit the USA in the first half of 1975 to become acquainted with the technical documentation and operation of pilot-plant equipment for gasification of coal and oil and with methods of economic calculations, and to develop programs for cooperation. A US team will visit the USSR in the second half of 1975 for familiarization with technical documentation on coal and oil gasification and to summarize the results of the work accomplished.

A Soviet team of experts on clean fuel production by the integrated cycle will visit the USA in the first quarter of 1975. The two sides will discuss initial data and determine which data are necessary for designing power plants which use fuel gasification and will develop a working program for cooperation. A US team of experts in the same field will visit the USSR in the second half of 1975 to evaluate designs of power plants which use fuel gasification, to select optimum designs, and to update the program of future work.

The US side has expressed the desire to send a delegation of experts to the USSR in the third quarter of 1975 to discuss processing of oil shale and to develop a program for cooperation. The Soviet side will examine this proposal in the first quarter of 1975.

Working Group I-2 on Stationary Source Air Pollution Technology will coordinate the cooperative efforts under projects I-2.1, I-2.2, and I-2.3.

Responsible organizations: US: Environmental Protection Agency; USSR: Ministry of Chemical and Petroleum Machine Construction (Projects I-2.1 and I-2.2), Ministry of Construction Materials (Project I-2.2), Ministry of Petrochemical and Oil Refining Industry, Ministry of Ferrous Metallurgy, Academy of Sciences of the USSR, and Ministry of Coal Industry (Project I-2.3).

Project I-3.1 Transportation Source Air Pollution Control Technology

During the first quarter both sides will clarify lines of further co-operation for 1975.

During the second quarter a Soviet team will visit the USA for familiarization with the use and testing of systems of catalytic control equipment for automobile emissions. Both sides will also develop a long-range plan for the study of pollutants including reactive hydrocarbons, aldehydes, polynuclear aromatic compounds, and particulates.

During the third quarter a US team will visit the USSR to study equipment for reducing toxicity, e.g., stratified charge engines and improved combustion components of automotive engines. During this visit the results of Soviet research on aldehydes, benzopyrene, and other compounds will be discussed.

Bearing in mind the wishes of the US side, the Soviet side will clarify its position on the question of cooperation in preventing air pollution from emissions from air craft and small engines, primarily motorcycles.

Responsible organizations: US: Environmental Protection Agency; USSR: Ministry of Tractor and Agricultural Machine Building.

AREA II -- PREVENTION OF WATER POLLUTION

Cooperation in this area will be carried out by four projects under two joint working groups:

Project II-1.1 Studies and Modeling of River Basin Pollution

In September of 1975 the current program of work will culminate in a symposium on The Use and Limitations of Mathematical Models to Optimize Water Quality Management. The proceedings will be published in Russian and English. Detailed plans for the format and content of presentations for the symposium will be agreed to six months in advance. Exchanges for up to one month of two specialists from each country, previously planned for 1974, will take place before the end of the first quarter of 1975.

For work beginning in 1976 to be concluded in 1978, the project title will be changed to "River Basin Water Quality Planning and Management," and new work plans will be drawn up in this area.

Project II-1.2 Protection and Management of the Water Quality in Lakes and Estuaries

The program for exchange of information and data will be continued and expanded. Samples for comparison of methods for determining the chemical composition of water and sediments will be exchanged with exchange of results to be accomplished in September 1975. Plans for study of residues

of toxic substances in fish will be developed in 1975. In September 1975 the above mentioned symposium on The Use and Limitation of Mathematical Models to Optimize Water Quality Management, which will be held in the USSR, will summarize and discuss results to date. The proceedings will be published in Russian and English.

Project II-1.3 Effect of Pollutants Upon Aquatic Ecosystems and Permissible Levels of Pollution

The symposium planned earlier on Methods for Establishing Maximum Permissible Concentrations for Various Substances in Lakes and Rivers will be held in the first quarter of 1975 in Duluth, Minnesota. The symposium proceedings will be published in Russian and English in an EPA Ecological Research Report series.

The work of Projects II-1.1 through II-1.3 will be coordinated by Working Group II-1 on River Basins, Lakes and Estuaries, and Aquatic Ecosystems. The third meeting of the Working Group will take place in the USSR in the third quarter of 1975.

Responsible organizations: US: Environmental Protection Agency; USSR: Ministry for Reclamation and Water Management (for Project II-1.1), Hydrometeorological Service (for Project II-1.2) and USSR Academy of Sciences (for Project II-1.3).

Project II-2.1 Prevention of Water Pollution from Industrial and Municipal Sources

In May 1975 a symposium on Sludge Handling, Treatment, and Disposal will be held in the USSR. During September 1975 a symposium on Physical-Chemical Waste Treatment will be held in the USA.

In addition, further cooperation is scheduled in the four industrial fields concerned with treatment of wastewater:

(1) Pulp and Paper Industries: A US team will visit the USSR in February 1975;

(2) Chemical and Petrochemical Industries: A US team will visit the USSR in June 1975;

(3) Petroleum Refining: A Soviet team will visit the USA and a US team will visit the USSR, on dates to be established;

(4) Metallurgy (Ferrous Metals): A US team will visit the USSR in the first quarter of 1975 and a Soviet team will visit the USA in the second quarter of 1975.

These exchange visits are intended to give a broad overview of the wastewater treatment facilities employed by these four industrial areas in both the USA and the USSR.

Working Group II-2 on Prevention of Water Pollution from Industrial and Municipal Sources will coordinate this project. During the meeting of the Working Group to be held in the USSR during May 1975 in conjunction with the above mentioned symposium, the result of exchanges of specialists will be evaluated with a view to developing a further series of exchanges of specialists for extended periods as well as holding specialized symposia on mutually agreed subjects.

Responsible organizations: US: Environmental Protection Agency; USSR: Ministry for Reclamation and Water Management.

AREA III -- PREVENTION OF POLLUTION ASSOCIATED WITH AGRICULTURAL PRODUCTION

The cooperation in this area includes the following four projects:

Project III-1.1 Integrated Pest Management

Research work will be conducted along the following lines: application of entomophags and microbiological preparations, development and evaluation of effectiveness of pheromone utilization and methods of sterilization, the study and utilization of germplasm in integrated pest management systems as well as elaboration of mathematical models of agroecosystems. Joint experiments are planned to be held.

During the first quarter an agreement will be reached on a visit of four US scientists to the USSR for five months.

During the second and the third quarters two Soviet delegations (totaling six persons) will visit the USA for collection and introduction of entomophags and phytophags as well as for studying the technology of mass rearing, sterilization, and mechanized introduction of entomophags.

During the first quarter an agreement will be reached on holding joint experiments on the following questions: (1) testing of a codling moth pheromone, (2) testing of wheat varieties resistant to rust, (3) testing of microbiological preparations, and (4) validation of biological models of agroecosystems.

During the first quarter the two sides will furnish lists for organizing the exchange of biological materials and chemicals which could be useful for integrated pest management systems.

During the fourth quarter the third conference on integrated pest management will be held in the USA, where the results of joint experiments will be discussed and analyzed.

Project III-2.1 Interreaction Between Forests, Plants, and Pollutants

In the first half of 1975 the Soviet side will designate its responsible organization and project leader and the US and Soviet project leaders will initiate communications. During the third quarter a meeting of specialists will be held either in the USA or the USSR to develop a program of cooperation.

Project III-3.1 Forms and Mechanisms by which Pesticides and Chemicals are Transported

During the first quarter research results and descriptive data on the occurrence and movement of agricultural chemicals in the environment will be exchanged. During the second quarter a meeting for the exchange of information and to further define a program of cooperation will take place in the USSR.

Project III-4.1 Effect of Chemicals Used in Agriculture on Fauna

During the second or third quarter, a meeting of specialists to develop a plan of cooperation will take place in the USA.

Responsible organizations: US: Department of Agriculture (with the participation of the Environmental Protection Agency and the Department of the Interior); USSR: Ministry of Agriculture and (for Project III-3.1) Hydrometeorological Service.

AREA IV -- ENHANCEMENT OF THE URBAN ENVIRONMENT

Cooperation in this area will be carried out by five projects which will be coordinated by Working Group IV.

Project IV-1.1 Ensuring Adequate Environment in New Communities and Newly Developing Areas

On the question of environment in new communities the work program involves determination of environmental criteria for site selection and for providing adequate environment in new communities. During the first quarter 1975 a Soviet team will visit the USA. At this meeting the two sides will discuss the proposed work program and questions related to publication of a joint document on assuring an adequate environment in new communities.

On the question of environment of communities in the North the work program involves the study of special characteristics of planning and building cities and ensuring an adequate urban environment in the North. During March-April a US team will visit the northern regions of the USSR. During the third or fourth quarter a Soviet team will visit Alaska.

Project IV-1.2 Improvement of Environment with Regard to Historic Places and Monuments

This project encompasses cooperation on questions of restoration techniques and public policy toward preservation and use of historic monuments and historic urban quarters. By February 1, 1975 dates will be determined for a visit of US specialists to the USSR. Following this visit Soviet specialists will visit the USA.

Project IV-1.3 Removal and Processing of Solid Waste in Urban Areas

This project involves public policy, technology, and basic research on solid waste management practices; removal of solid household wastes from high-rise buildings; elaboration of technical specifications for equipment to remove waste from buildings; solid waste disposal using transfer stations in order to reduce waste transfer costs and the need for landfills near cities; and technical specifications of these stations. During the second quarter of 1975 US experts will visit the USSR. During the third quarter Soviet experts will visit the USA.

Project IV-1.4 Enhancement of Environment in Existing Cities

On the question of city transportation the work program involves determination of rational correlations between public transit and individual transportation systems in various size cities. During the first quarter of 1975 a Soviet team will visit the USA, and during the third quarter a US team will visit the USSR. Technical information will be exchanged. Work will be carried on toward a joint project document to be published in the fourth quarter of 1975 or the first quarter of 1976.

On the question of city noise, the work program involves town planning aspects of noise level abatement in existing cities and new communities as well as questions related to lessening or preventing effects of noise on people. During 1975 technical information will be exchanged.

On the question of urban land use policies the work program involves norms and standards for land use and their influence on urban environment. During 1975 technical information will be exchanged.

Project IV-1.5 Recreation Zones in Urban and Near-Urban Areas

This project involves improvement of the methods of planning and building near-urban land for recreation facilities for residents of large cities. During 1975 technical information will be exchanged.

Working Group IV-1 on Enhancement of the Urban Environment will coordinate the above-mentioned projects. The fourth meeting of the Working Group will take place in the USSR in September 1975.

Responsible organizations: US: Department of Housing and Urban Development; USSR: The State Committee for Civil Construction and Architecture attached to GOSSTROI.

AREA V -- PROTECTION OF NATURE AND THE ORGANIZATION OF PRESERVES

Cooperation within this area has been organized under the following projects:

Project V-1.1 Conservation of Wild Species of Fauna and Flora

The project leaders will meet approximately every 18 months, alternately in the USA and the USSR.

During the first half both sides will negotiate a convention for the conservation of migratory birds, their habitats, and other wild fauna and flora. This convention may be expanded in the future to include provisions for conserving unique natural ecosystems.

The Soviet side will propose a plan for further cooperation in the utilization of computers in storing and analyzing data on bird migration. This proposal will provide for a two to three week visit of a Soviet specialist to the USA during the second half of 1975 and a similar visit of a US specialist to the USSR during the second half of 1975.

Two US specialists will visit the USSR during the second half of 1975 to receive not less than twenty Siberian polecats (*Mustela eversmanni*) and to study these animals in their natural habitat, if possible. The captured animals will be shipped to the USA for use as surrogates for the endangered black footed ferret (*Mustela nigripes*).

The US side will assist the Soviet side in obtaining information from US specialists about the breeding of the beaver in captivity and will try to arrange a visit of two Soviet specialists to a beaver farm in 1975.

By January 31, 1975 both sides will prepare 1975-1976 work plans for cooperative study of (1) raptors, with emphasis on the peregrine falcon; (2) northern waterfowl; (3) the wolf (*Canis lupus*); and (4) threatened or endangered species of plants as well as the introduction of exotic species. These plans will include necessary visits by US and Soviet specialists.

By March 31, 1975 both sides will prepare 1975-1976 work plans for further development and exchange of educational materials and public information including lectures, publication of popular booklets, TV films, and documentary films.

Project V-2.1 Protection of Northern Ecosystems

Cooperative work will henceforth be carried out in two major fields:

A. Structure, Function, and Productivity of Northern Ecosystems as Related to their Protection and the Monitoring of Environmental Change

During the second half a US team will visit the USSR to discuss productivity and functional interrelations in taiga and tundra ecosystems for the purpose of their protection and management. A work program will be developed for exchanges of material and specialists and a joint symposium.

At the invitation of the USSR Academy of Sciences two US scientists will visit Yakutsk in August to collaborate in the development of computer models which will assist in predicting and solving environmental problems of northern development.

The US side proposes that in 1975 the two sides exchange information about their present hydrological and biogeochemical studies in the Magadan Oblast and Alaska. The Soviet side will consider this proposal and will inform the US side of its decision in the first half of 1975.

US specialists attending the International Botanical Congress at Leningrad in July 1975 will discuss with their Soviet colleagues a work program on biological indicators of environmental change caused by natural and anthropogenic impacts.

During the third or fourth quarter one-three US parasitologists will visit the USSR to study parasites and diseases of northern species of wild plants and wild animals. Exchanges of collections and publications between specialists of each side will continue.

During the summer of 1975 three Soviet experts in reindeer range ecology, domestic reindeer management, and reindeer physiology and diseases will work in Alaska with US specialists on the ecology and management of domesticated and wild reindeer.

US and Soviet specialists will exchange information and written proposals for cooperative ecological studies on polar bear populations in the USA and USSR. Both sides agreed to study in 1975 the US proposal for a visit of US specialists to Wrangel Island in 1976.

During the first quarter Soviet specialists will participate in the capture of 40 musk oxen on Nunivak Island and shipment to the USSR for resettlement. As soon as feasible, the Soviet side will initiate vegetation studies in the release sites (Taimyr Peninsula and Wrangel Island) as part of a program of exchanges of information and specialists on the ecology and management of musk oxen.

B. Methods of Preservation, Mitigation, and Restoration of Adverse Disturbances in Northern Ecosystems

During the summer of 1975 Soviet permafrost and pipeline experts (including representatives from the oil, gas, and construction industries) will visit Alaska to study permafrost-related environmental problems posed by the construction and operation of pipelines and other transport systems. A reciprocal visit by a US team to the USSR is envisaged for 1976.

During the third quarter a US team will visit the USSR for 2-3 weeks to familiarize itself with the work of forestry research centers and field stations where studies are being conducted on the effects of wildfire and fire-control methods on northern taiga and tundra ecosystems.

During the third quarter a Soviet team will visit research sites in Alaska and other areas of the USA to study reclamation and revegetation of land disturbed by mining. A reciprocal trip of a US team to the USSR will take place in 1976.

By the end of the second quarter of 1975 both sides will prepare plans for cooperative work on the determination of persistent pesticides in wildlife species of northern ecosystems.

The next working meeting of the project leaders will take place during the third or fourth quarter in the USA to discuss the progress of the program as well as further cooperative work.

Project V-3.1 Protected Natural Areas and National Parks

The project leaders will meet approximately every 18 months, alternately in the USA and the USSR.

In 1975 work will begin on a bilingual glossary of nature preservation and conservation terms. Each side will provide definitions of terms to be included in both English and Russian.

During 1975 both sides will undertake preparations to facilitate participation of citizen organizations in the implementation of this project. Citizen organizations of the two countries concerned with the preservation and conservation of nature and outdoor recreation will become involved in the project through exchange of: (a) popular publications; (b) information on the activities of these citizen organizations; (c) the names of the persons responsible for these activities; and (d) future exchange of persons representing these organizations.

In the third quarter both sides will undertake preparations to facilitate the development of educational and public information programs. These will include educational films, TV films, publications of popular booklets, lectures, and other types of information suitable for public dissemination.

Both sides agreed to examine the possibility of continuing the production of TV films on protected natural areas and national parks in both countries similar to the one produced during 1974 by a US film crew about Soviet preserves.

During the fourth quarter the two sides will jointly publish a collection of articles treating the subject of preservation and conservation of nature in specially protected areas of the USA and the USSR. The articles will be prepared by specialists designated by each side. Publication will be in English and Russian, each side preparing its articles in both languages.

In connection with the above programs, in the fourth quarter each side will designate one or two specialists conversant in English and Russian, who jointly will spend up to 45 days in each country to study common problems of the preservation and conservation of nature in specially protected areas of both countries. The specialists will represent their respective project leaders and will jointly prepare a plan for future cooperative work. The Soviet side proposes that such exchange be carried out on the "receiving side pays" basis.

Project V-4.1 Biosphere Reserves

The Joint Committee approved a new project on biosphere reserves in consonance with the provisions of the US-USSR communique signed in Moscow on July 3, 1974. In the first quarter both sides will designate project leaders. The first step in cooperative work on this project will be a preliminary meeting of USSR and US specialists in the US in the first half of 1975. As a second step a symposium on biosphere reserves will be held in the USSR during the second half to discuss (1) concepts guiding the selection of biosphere reserves within the guidelines set by the "Man and the Biosphere" program initiated by UNESCO and examples of implementation of these concepts; (2) means of preserving natural ecosystems; and (3) problems and methods of scientific research used in the acquisition of baseline data on the dynamics of ecosystems, and monitoring of the environment. The proceedings of the symposium will be published in the English and Russian languages. Arrangements for the symposium will be resolved by correspondence between the project leaders.

Responsible organizations: To be designated in the first quarter of 1975.

Project V-5.1 Protection of Arid Ecosystems

This project will involve a multidiscipline approach involving the study of structure and functions of arid ecosystems and the impact of man's activities. Each side will appoint project leaders during the first quarter of 1975, will exchange project outline drafts during the second quarter, and will consider an exchange of specialists in 1975.

Responsible organizations for Projects V-1.1, V-2.1, V-3.1 and V-5.1:
US: Department of the Interior, with the Forest Service of the Department of Agriculture (for Project V-3.1); USSR: Ministry of Agriculture, USSR.

Project V-6.1 Marine Mammals

The next meeting of the project specialists will be held in the second quarter in Leningrad. Immediately after their meeting there will be a meeting of specialists on walrus biology and protection.

Two US scientists will participate for a two-month period in a Soviet-sponsored whale research cruise in the eastern Pacific Ocean. The US scientists will board the Soviet vessel early in January 1975.

An aerial assessment survey on walruses will be conducted in the third quarter for a duration to be agreed upon. This survey may also cover bowhead whales. The Soviet side has invited two US scientists aboard a Soviet ship in the third quarter for a survey of walruses in the Pacific.

Two Soviet scientists will work with the porpoise research program at an appropriate research institution in the USA for 2-3 weeks in spring 1975.

The Soviet side invites two US specialists in the second or third quarters of 1975 to take part in morphological and systematic studies of the island seal on the Commodore Islands.

Responsible organizations: US: National Oceanic and Atmospheric Administration and the US Department of the Interior; USSR: Ministry of Fisheries.

In 1975 the two sides will examine the possibility of cooperation and the means of investigating and protecting biological and cultural resources of mutual interest to the USA and the USSR in the Bering Straits Region.

AREA VI -- PROTECTION OF THE MARINE ENVIRONMENT FROM POLLUTION

Cooperation in this area will be carried out by two projects:

Project VI-1.1 Prevention and Clean-Up of Pollution of the Marine Environment from Shipping

The next meeting of the project leaders and experts will be held in the USA in the third or fourth quarter of 1975 and will last up to two weeks.

In 1975 cooperation will be developed along the following main lines:

(1) Methods and technical equipment to most effectively meet the requirements arising from the 1973 International Convention for the Prevention of Pollution from Ships (instruments for monitoring oil content in the water discharged from ships, equipment for shipboard sewage treatment, port reception facilities for the treatment of various kinds of pollutants, identification of the source of pollutants on the sea surface, and related subjects).

(2) Methods and technical equipment for preventing and eliminating the consequences of wide-spread spills of oil and chemical cargoes (vessel traffic control systems for preventing collisions and grounding, special vessels and equipment for localizing oil spills and collecting noxious substances from the water surface, chemical dispersants and surface collecting agents, their characteristics and methods of their usage, and related subjects).

A concrete list of items in line with the trends of cooperation for 1975 mentioned above will be agreed upon during the December 1974 meeting of specialists held in Moscow concurrently with the Joint Committee meeting.

An exchange of one or two reciprocal visits by specialists, approximately 6 persons from each side for 6-10 days, is proposed. The final decision on the exchange of delegations, duration of visits, and number of members for each delegation will be determined later by correspondence between the project leaders. In addition, the Soviet side will consider the invitation for participation of experts in the Conference on Oil Pollution which will be held under the sponsorship of the American Petroleum Institute, Environmental Protection Agency, and Coast Guard in San Francisco during the first quarter of 1975.

Responsible organizations: US: U. S. Coast Guard, Department of Transportation; USSR: Ministry of the Merchant Marine.

Project VI-2.1 Effect of Pollutants on Marine Organisms

A project meeting will be held in the USA at the beginning of the second quarter of 1975. The purpose of this meeting is discussion and clarification of proposals made by both sides about the following fields of cooperation:

- (1) Publishing in 1975 of a joint US-Soviet collection of articles on the subject of marine environmental quality and the effect of pollutants on marine organisms.
- (2) Methods of chemical and hydrobiological analysis for detection of the degree of pollution of the marine environment to be intercalibrated on board US and Soviet research vessels in the third quarter of 1975.
- (3) A seminar for development of a report: "Scientific Base of a Global System of Observation of Pollution of Marine Environment and its Effect on Marine Organisms." The biological portion of the seminar will be held in the USA in the fourth quarter of 1975; the chemical part will be held in the USSR in the same quarter.
- (4) Exchange of specialists in the field of chemistry and hydrobiology of the marine environment with one Soviet delegation to visit the USA during the third quarter of 1975 and one or more US delegations to visit the USSR in the second or third quarters.

Responsible organizations: US: Environmental Protection Agency and the National Oceanic and Atmospheric Administration; USSR: Hydrometeorological Service.

AREA VII -- BIOLOGICAL AND GENETIC EFFECTS OF ENVIRONMENTAL POLLUTION

Cooperation in this area will be carried out under two projects:

Project VII-1.1 Biological and Genetic Effects of Pollutants

Mutagenesis: In addition to exchange of reports and other information, a joint workshop in Techniques in Population Monitoring in Environmental Mutagenesis and Carcinogenesis is planned for April 1975 in the USA.

Epidemiology: Following a small working meeting in the first quarter of 1975 in the USA to discuss the US experience with epidemiological studies of the health effects of atmospheric sulfur oxides, the project leaders will discuss the possibility of developing in 1975 collaborative research efforts and exchanges of scientific personnel including scientists engaged in the statistical aspects of designing and evaluating epidemiological studies.

Heavy metals: The protocols currently being developed by both sides on the health effects of cadmium and zinc will include proposals for cooperation in 1975.

Psychophysiological factors: During the first quarter of 1975 a research program will be agreed upon including possible exchanges of specialists working on psychophysiologic effects of environmental factors.

Responsible organizations: US: National Institute of Environmental Health Sciences, Department of Health, Education and Welfare, and the Environmental Protection Agency; USSR: USSR Academy of Sciences.

Project VII-2.1 Comprehensive Analysis of the Environment

A meeting of experts will take place in the USA during February. Both sides will discuss and propose preparations for a November 1975 symposium to include discussion of certain of the following problems identified at the March 1974 Tbilisi symposium as requiring urgent attention:

- (1) More complete accounting of pollution sources and receptors, types of impacts and biological reactions, as well as peculiarities of the area or region where such impact occurs;
- (2) Investigation of dose/response relationships in toxicological, genetic, and other experiments;
- (3) Scientific substantiation of environmental monitoring techniques with due consideration of critical links in analyzed systems;
- (4) Studies of the fate and effects of multimedia pollutants, supplemented by development of the required standards;
- (5) Assessment of the needs for separate standards limiting long- and short-term dosages of selected environmental pollutants;
- (6) Methods for evaluating the response of ecosystems to varying environmental conditions;
- (7) Development of criteria for scientifically permissible environmental loading and identification of critical links;
- (8) Development of practical quantitative methods which will permit comprehensive environmental analysis to be applied effectively to environmental problems;
- (9) Development of methodology for assessment of possible economic damage resulting from man's impact on the environment; and
- (10) Feasibility of a joint US-USSR monitoring system.

During June 1975 a meeting of experts will take place in the USSR to prepare for the above mentioned symposium.

Responsible organizations: US: Environmental Protection Agency; USSR: Hydrometeorological Service.

AREA VIII -- INFLUENCE OF ENVIRONMENTAL CHANGES ON CLIMATE

Cooperation in this area will be carried out by three projects co-ordinated by a working group:

Project VIII-1.1 Effects of Changes in the Heat Balance of the Atmosphere on Climate

Modeling of the climate:

One or two Soviet scientists will work at the Geophysical Fluid Dynamics Laboratory of NOAA during 1975 on the study of climate sensitivity and stability, radiation effects of particulates, and numerical integration methods.

Two Soviet scientists will work at the National Center for Atmospheric Research in Boulder, Colorado to study modeling of climatic perturbation and to study effects of sea ice on climate.

US scientists will work at the Computing Center of the Siberian Branch of the USSR Academy of Sciences at Novosibirsk and the Main Geophysical Observatory in Leningrad to study numerical modeling of climate, and at the Hydrometeorological Center in Moscow to study problems of climate prediction and documentation. The length of these reciprocal visits is up to three months.

Assessment of past changes of the climate on the basis of analysis of natural objects and data:

A US team will visit the USSR in the second or third quarter to discuss quaternary glaciation.

Interactions of the atmosphere with polar regions and the oceans as they affect climate:

Two Soviet scientists will work at the AIDJEX Project at the University of Washington in the second half of 1975.

US scientists will work at the Arctic and Antarctic Research Institute in Leningrad on problems of polar areas as they affect climate.

Project VIII-1.2 Effects of Pollution of the Atmosphere on Climate

A US team will visit the USSR in the second or third quarter to discuss atmospheric optics and aerosols. Other US scientists will work at the Main Geophysical Observatory of the Hydrometeorological Service in Leningrad on problems of measuring minor constituents in the atmosphere.

Arrangements will be developed in 1975 for a Soviet scientist to work at the Mauna Loa Baseline Station for a period of one to three months in early 1976. He will bring with him Soviet instruments to measure ozone, atmospheric aerosols, and turbidity. A US scientist will visit the USSR for several weeks to explore possible development of cooperative projects on the effects of pollution on climate.

Several Soviet scientists will visit Boston, Massachusetts and Washington, D. C. during the first quarter of 1975 to report and discuss progress on experiments and data exchanges pertaining to the effect of pollution on the upper atmosphere. The visit will include attendance at the Fourth Climatic Impact Assessment Program Conference at Boston February 4-7, 1975.

Project VIII-1.3 Influence of Solar Activity on Climate

A Soviet team will visit the USA in January 1975 to discuss solar activity and climate variations and to attend the joint meeting of the American Meteorological Society in Denver and the American Astronomical Society in Boulder, Colorado. A US team will visit the Institute of Earth Magnetism and Solar Radiation in Izmiran, USSR in the third quarter to discuss questions of the forecasting of solar disturbances.

A Soviet scientist will work at Stanford University to study the analysis of variations of temperature and pressure fields in the atmosphere during solar disturbances.

The work of Projects VIII-1.1 through VIII-1.3 will be coordinated by Working Group VIII-1 on Influence of Environmental Changes on Climate. The next meeting of the working group will be held in Princeton, New Jersey in October 1975. A preparatory meeting of a few experts is planned for July 1975 in the USSR.

Responsible organizations: US: National Oceanic and Atmospheric Administration; USSR: Hydrometeorological Service.

AREA IX -- EARTHQUAKE PREDICTION

The object of cooperation in this area is the reduction of losses caused by earthquakes and tsunamis. Cooperative work in this area will be conducted under five projects, four of which will be coordinated by a working group:

Project IX-1.1 Field Investigations of Earthquake Prediction

A. Proposed work in the USSR:

In the course of the second-fourth quarters of 1975 the US Geological Survey will continue observations of earthquakes in the Garm region of Tadjikistan which began in 1974. This work will be carried out jointly by Soviet and US specialists with both Soviet and US apparatus.

At the same time specialists from the University of California at San Diego will begin observations in the Garm region with a new digitizer for investigating earthquake spectra. These observations will be compared with results of work with the Soviet frequency-selecting seismic station "CHISS." For analysis of the materials the specialists from the University of California at San Diego will bring their own "INTERDATA" mini-computer.

At the same time observations with seismic apparatus will begin in the region of the Nurek Reservoir. This work will be carried out by specialists of the Lamont-Doherty Geological Observatory of Columbia University for the purpose of investigating earthquakes connected with the filling of the Reservoir.

In the course of the second-third quarters the US Geological Survey plans to carry out joint investigations of the geological conditions giving rise to earthquakes in the Garm region. This work will begin after agreement is reached on the scales and topographic base materials required for this work.

To carry out this work up to 24 man-months effort by US specialists will be required.

B. Proposed work in the USA:

One specialist in geochemistry will spend one month in the USA to learn about geochemical work on ground waters carried out there.

In the course of the second and third quarters, two Soviet geologists will carry out geological investigations in the region of the San Andreas Fault for a total of approximately 3 man-months. This work will be carried out only if agreement can be reached on the materials for the geological work in Garm.

Two or three Soviet seismologists will spend a total of up to 8 man-months in the USA to participate in analysis of data collected in Garm.

Project IX-1.2 Laboratory and Theoretical Investigations of the Physics of the Earthquake Source

It is proposed that a US theoretical physicist will spend two months in the second quarter of 1975 working on a joint research program at the Laboratory of Theoretical Physics of Earthquake Sources, Institute of Physics of the Earth, USSR Academy of Sciences.

Soviet specialists will work at the US Geological Survey in Menlo Park to continue what was begun in 1974 on investigating earthquake fore-runners under laboratory conditions. Other Soviet specialists will work in Boulder, Colorado to familiarize themselves with new holographic methods of modeling processes of breakage and new automatic equipment for studying rock deformation.

All the work on this project is planned for the second-fourth quarters. For this project up to 8 man-months effort by Soviet scientists will be required in the USA.

Project IX-1.3 Mathematical and Computational Prediction of Places Where Large Earthquakes Occur and Evaluation of Seismic Risk

A. Proposed work in the USSR:

US specialists will spend approximately one month in the USSR to discuss computation procedures for investigating places where large earthquakes occur and the results of the application of these techniques to the territory of California and to the seismically active regions of the USSR. Two US specialists will spend a total of approximately two man-months in the second-fourth quarter in the USSR to become acquainted with the mathematical algorithms and computer programs.

B. Proposed work in the USA:

Two Soviet specialists will collect and prepare materials required for the evaluation of places where large earthquakes occur in the USA and will carry out computer calculations. Two other Soviet specialists will work in the second-fourth quarter to develop new algorithms for the calculation of seismic risk.

The total effort will approximate 9 man-months for Soviet scientists in the USA for this project.

Project IX-1.4 Engineering-Seismological Investigations

A. Proposed work in the USSR:

The construction of a network of strong-motion seismological stations in Tadzhikistan is planned using both Soviet and US apparatus. The US apparatus will include 18 three-component accelerographs. These instruments will be placed in buildings and on dams in various ground conditions.

A building of typical US construction will be jointly planned. The Soviet side will begin construction of this building at the Lyaure Test Ground for the future investigation utilizing vibrating machines and explosions. Both US and Soviet vibrating machines and test equipment will be used in the experiments.

For the execution of this work up to 4 man-months of US specialists' effort will be required in the USSR.

B. Proposed work in the USA:

A test building will be constructed on the shake-table at the University of California at Berkeley.

The work begun in 1974 on the investigation of the parameters of ground motion and buildings during strong earthquakes for the development of an instrumental intensity scale will be continued.

For the execution of the work up to 8 man-months of Soviet specialists will be required in the USA during the second-fourth quarters.

The results of all work of the Projects IX-1.1 through IX-1.4 will be formulated in joint reports and articles including examples of original data.

In the beginning of 1976 it is proposed that a special collection of joint papers summarizing the results of work in 1974-1975 will be prepared for publication.

The visits for the USA in the USSR for Projects IX-1.1 through IX-1.4 will take place during the second-fourth quarters of 1975. For all these four projects the total effort abroad shall not exceed 34 man-months. However, both sides agree that in view of the successful beginning of cooperation and the results achieved in 1974, there may be an increase in the exchange of scientists from both sides if related financial problems can be resolved.

The work of Projects IX-1.1 through IX-1.4 will be coordinated by Working Group IX-1. No joint meeting of the working group is planned for 1975.

Responsible organizations: US: US Geological Survey; USSR: USSR Academy of Sciences.

Project IX-2.1 System of Simultaneous Warnings on Tsunamis

During the first quarter of 1975 each side will identify seismic and tide stations from which data will be exchanged using standard formats. Both sides will investigate and test ways of establishing reliable communications between Khabarovsk and Honolulu, an essential element of a system of simultaneous warning on tsunamis. The use of World Meteorological Organization and World Weather Watch (WMO/WWW) channels and formats will be investigated. The operational communication procedures for tests and real-time warnings will be discussed during the second meeting of experts in the third quarter of 1975 in the USSR.

In order to improve the scientific basis for tsunami warnings, both sides plan to undertake starting in 1975, a joint program of theoretical and laboratory investigation aiming, as a first objective, at developing numerical methods of solving seismological and hydrodynamical equations for modeling generation, propagation, and dissipation of tsunamis in the open ocean and in shallow sea. In particular, consideration will be given to joint cataloging and statistical research on existing tsunami data (including digitizing all existing tsunami records), and applying spectral techniques to obtain relationships between earthquakes which generate tsunamis and the waves thereby produced.

To facilitate this program an exchange of scientists, equalling three man-months from each side, is proposed. Publications and computer programs will be exchanged as well. The scientist exchange program, including tasks to be undertaken and a schedule, will be agreed upon during the first quarter.

During the third quarter the two sides will carry out a joint expedition for the purpose of recording tsunamis in the open ocean and of evaluating the use of bottom instruments for tsunami warning purposes. The Soviet side will provide a ship and the US side will provide the bottom tide gauges and related ship equipment. This expedition will be conducted in the region of the Kurile deepwater trench. Additional expeditions are foreseen for future years and other regions. The detailed program of this expedition, including additional geophysical and hydrological observations will be composed in the first quarter. Preliminary actions will be taken during 1975, leading to a 1976 joint seismic experiment consisting of registering strong earthquakes in two places, i.e., Honolulu and Yuzhno-Sakhalinsk, using instruments from each side yielding comparable results in the pass band from 1 to 300 seconds.

Responsible organizations: US: National Oceanic and Atmospheric Administration; USSR: Hydrometeorological Service of the USSR.

AREA X -- ARCTIC AND SUBARCTIC ECOLOGICAL SYSTEMS

The two sides agreed to continue the cooperative program involving ecological systems of arctic and subarctic areas undertaken under other areas of the Agreement as follows:

(1) Waste water treatment in northern regions under Area II (Water Pollution).

(2) Ensuring adequate environment in new communities and newly developing areas, as well as waste management technologies in permafrost areas under Area IV (Urban Environment).

(3) Protection of northern ecosystems under Area V (Protection of Nature and Organization of Preserves).

(4) Meteorology and air/sea interaction of polar regions as they affect the climate of the planet under Area VIII (Climate).

Although the work under these projects will be carried out separately, the US-USSR Joint Committee or its representatives may review the progress under this area to provide coordination and liaison between the different working groups, and the representatives will meet if necessary.

AREA XI -- LEGAL AND ADMINISTRATIVE MEASURES FOR PROTECTING ENVIRONMENTAL QUALITY

Cooperation in this area will be carried out by two projects:

Project XI-1.1 Legal and Administrative Measures

During 1975 the exchange of information and literature in the legal and administrative fields will continue and two specialists from each side will be designated to carry out scientific research and to study legal and administrative aspects of environmental protection in each others' country beginning in the first half of 1975. The next meeting of US and Soviet experts will take place after the exchange of these specialists has begun and discussions at that meeting will, if possible, be based on the research of exchange specialists. New fields of cooperation will also be defined at that meeting.

The two sides will also facilitate the publication of articles on the legal aspects of environmental protection by US and Soviet authors in Soviet and US legal journals, including papers presented at meetings held in this project. Specialists from the two sides will continue consultations with respect to problems of international law in the field of environmental protection.

Direct contacts between nongovernmental, mass membership organizations, for example the All-Russian Society for the Protection of Nature and the Sierra Club and similar US organizations, will continue to be facilitated.

Responsible organizations: US: Council on Environmental Quality; USSR: Academy of Sciences of the USSR.

Project XI-2.1 Harmonization of Air and Water Pollution Standards

At the second meeting on this project, held concurrently with the third Joint Committee meeting, a work plan covering three basic areas of co-operation was adopted.

The two sides will cooperate on: (a) development of methodological aspects for the evaluation of environmental protection standards in the USA and USSR in 1975; (b) preparation of a unified glossary of terms and definitions in the field of environmental protection; and (c) exchange and analysis in 1975 of information concerning the economic aspects of the problems of standardization in the field of environmental protection, in view of the importance of economic justification of development and implementation of standards.

Both sides agreed to expand cooperation in the field of metrology including an exchange of standard reference materials.

The next meeting on this project will be held in the USA in October 1975.

Responsible organizations: US: US Department of Commerce and Environmental Protection Agency; USSR: State Committee for Standards.

As previously agreed, a US team of experts representing governmental organizations and private industry will visit Moscow during the first half of 1975 to present technical reports on instruments and equipment for monitoring, data analysis, and treatment of water pollution.

The US exhibition in Moscow of equipment for monitoring and analysis of environmental pollution which was planned for late 1974 or early 1975 has been postponed at the request of the US side until early 1976.

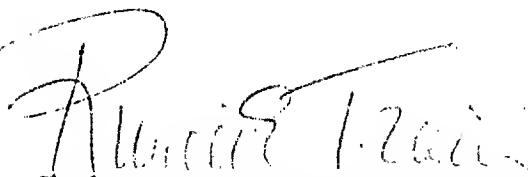
Responsible organizations: US: Department of Commerce and Environmental Protection Agency; USSR: All-Union Chamber of Commerce and Industry and Hydrometeorological Service.

Recognizing that changes of technological processes are among the most effective methods of environmental protection, both sides consider it worthwhile to examine the possibilities for scientific and technical co-operation in the field of creating non-waste technological processes.

Both sides reaffirmed their desire to facilitate and broaden non-governmental contacts between both countries in the field of environmental protection.

The next meeting of the Joint Committee will take place in Washington, D. C. in the last quarter of 1975. The Chairman or their representatives will meet during the period between meetings to resolve questions that arise in the implementation of plans for cooperation.

Signed in Moscow in the English and Russian languages, both texts being equally authentic, on December 12, 1974.



Chairman, US Side of the Joint Committee on Cooperation in the Field of Environmental Protection

Russell E. Train



Chairman, Soviet Side of the Joint Committee on Cooperation in the Field of Environmental Protection

Yu. A. Israel